



SPACE-BASED POSITIONING
NAVIGATION & TIMING
NATIONAL COORDINATION OFFICE

U.S. GPS Program and Policy Update

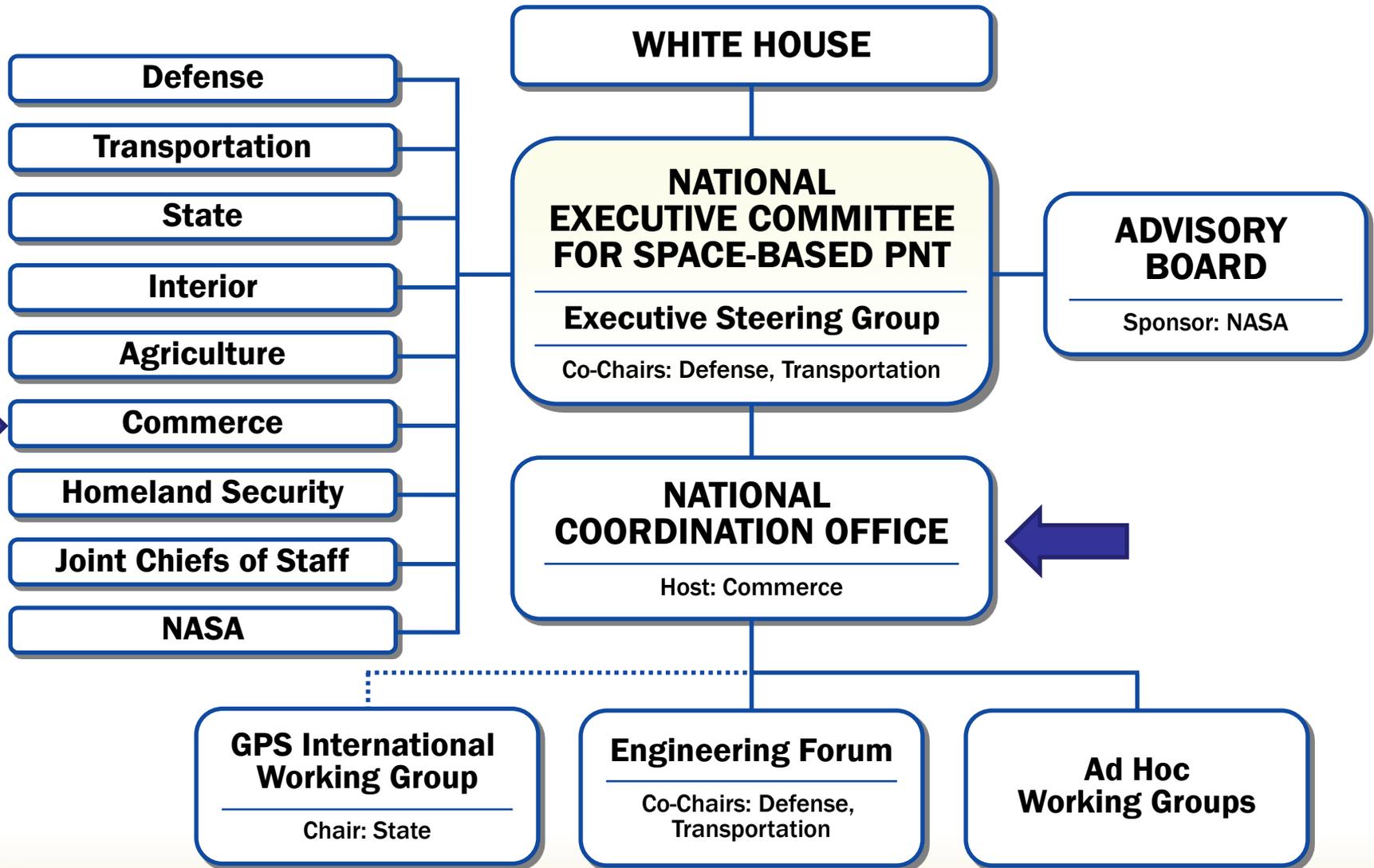
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**International Satellite Navigation Forum
Moscow, Russia
April 24, 2013**



U.S. Space-Based PNT Organization Structure





Keys to the Global Success of GPS



-  **1) Program Stability and Performance**
-  **2) Policy Stability and Transparency**
- 3) Commercial Market Innovation**



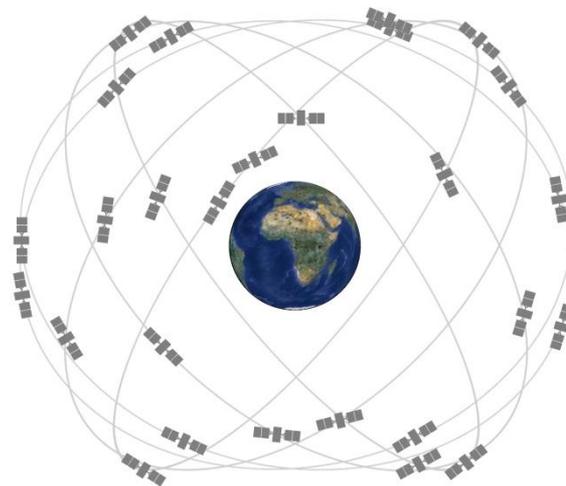
GPS Constellation Status



31 Operational Satellites

As of April 2013

- “Expandable 24” configuration (27 slots)
- 9 Block IIA
- 12 Block IIR
- 7 Block IIR-M
- 3 Block IIF
- 4 residuals on orbit
- Continuously assessing constellation health to determine launch need



Launch of Third GPS IIF Satellite



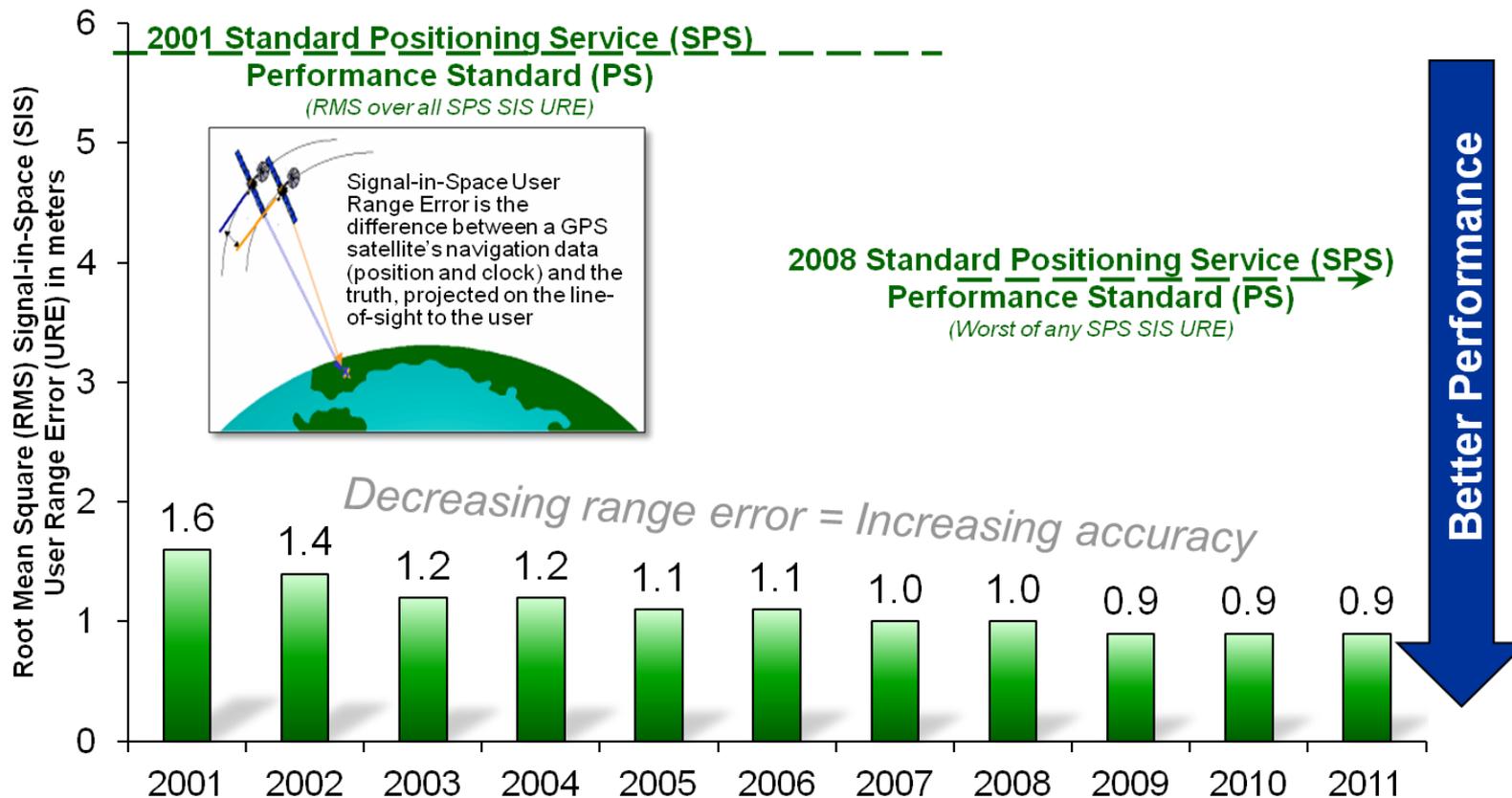
Launched Oct 4, 2012
Set healthy Nov 13, 2012



Next launch: May 15, 2013



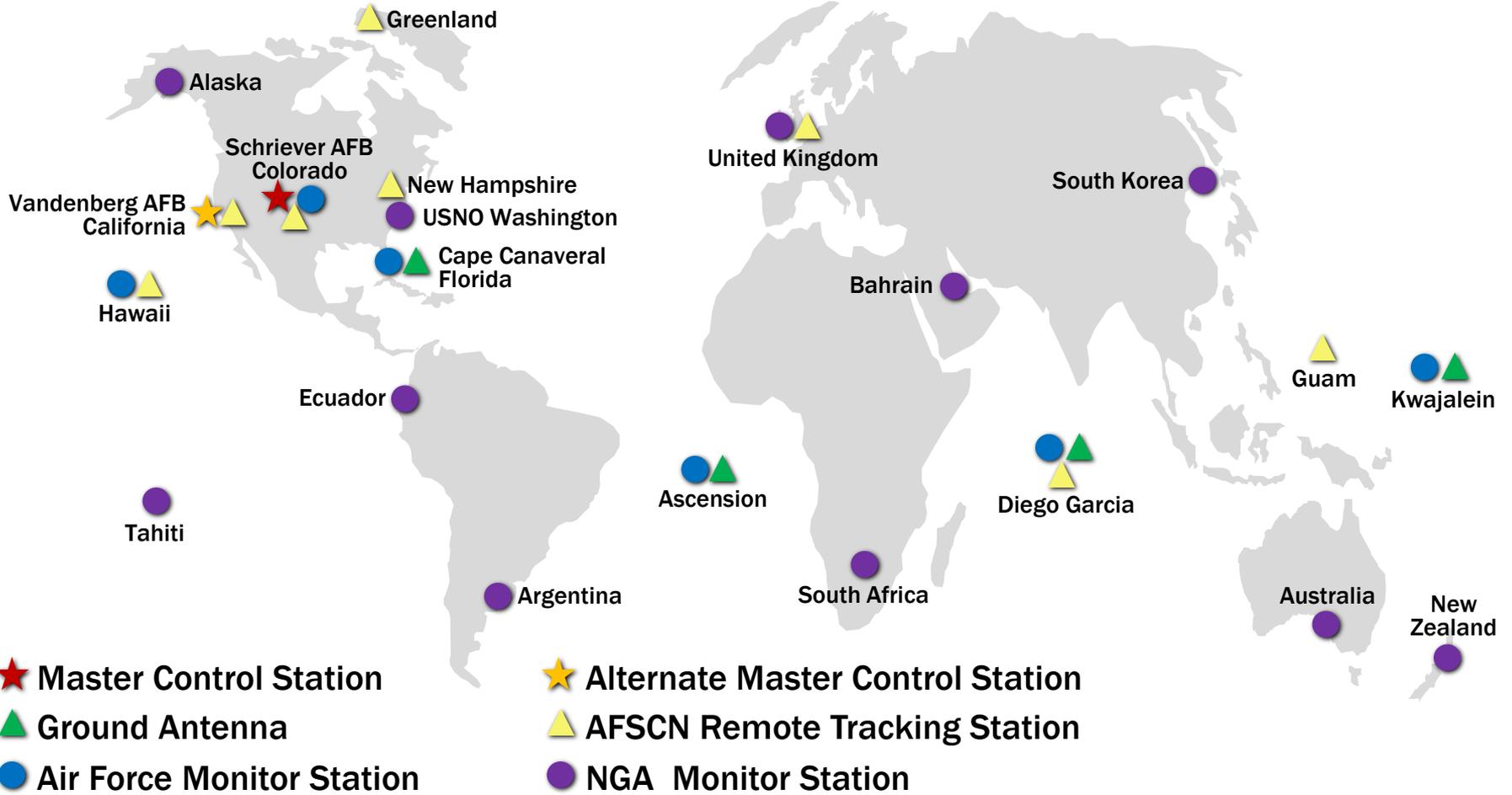
GPS Signal in Space Performance



System accuracy exceeds published standard

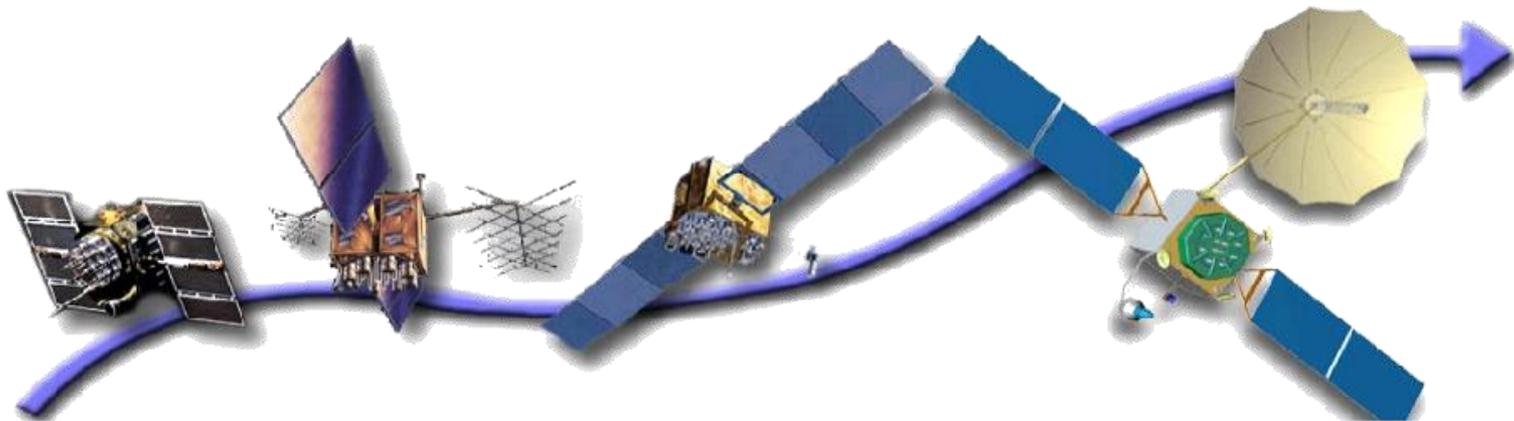


GPS Operational Control Segment





GPS Modernization Program



Increasing System Capabilities ♦ Increasing Defense / Civil Benefit

Block IIA/IIR

Basic GPS

- Standard Service
 - Single frequency (L1)
 - Coarse acquisition (C/A) code navigation
- Precise Service
 - Y-Code (L1Y & L2Y)
 - Y-Code navigation

Block IIR-M, IIF

IIR-M: Basic GPS capability plus

- 2nd civil signal (L2C)
- M-Code (L1M & L2M)

IIF: IIR-M capability plus

- 3rd civil signal (L5)
- 2 Rb + 1 Cs clocks
- 12 year design life

Block III

- Backward compatibility
- 4th civil signal (L1C)
- 4X better User Range Error than IIF
- Increased availability
- Increased integrity
- 15 year design life



New Civil GPS Signals



Signal	Benefits	# of Satellites Broadcasting Now	Availability on 24 Satellites
L2C	Meets commercial needs for ionospheric correction, higher effective power, etc.	10	~2018
L5	Meets requirements for safety-of-life transportation; enables triple-frequency positioning techniques	3	~2021
L1C	GNSS interoperability; performance improvements in challenged environments	Will start with GPS III in 2015	~2026



CNAV Message Testing



- **L2C and L5 signals are in development mode, providing no navigation data**
- **OCX will enable upload of civil navigation (CNAV) messages for L2C and L5**
- **Live-sky testing of L2C and L5 with CNAV planned for Jun 15-29, 2013**
 - Public participation encouraged; see www.gps.gov/pros
- **L2C and L5 will eventually replace civil need for semi-codeless access to military P(Y) signals**
- **All semi-codeless GPS users need to migrate to the new civil signals by Dec 31, 2020**



Status of GPS III and OCX



- **GPS Block III, Satellites 1-8**
 - Non-Flight Satellite Testbed completed testing
 - First 4 satellites now in production
- **GPS Block III, Satellites 9+**
 - On track to add search and rescue payload (SAR-GPS) and laser reflectors
 - Studying options for dual launch and other cost savings
- **Next Generation Operational Control System (OCX)**
 - Block 0 (GPS III launch and checkout): 2014
 - Block 1 (CNAV for L2C and L5): 2016
 - Block 2 (L1C and M-Code): 2017



U.S. Policy Promotes Global Use of GPS Technology



- **No direct user fees for civil GPS services**
 - Provided on a continuous, worldwide basis
- **Open, free access to information necessary to use civil GPS and augmentations**
 - Anyone can develop applications, user equipment, and value-added services
 - Encourages market-driven competition
- **Global compatibility and interoperability with GPS**
- **Service improvements for civil, commercial, and scientific users worldwide**
- **Protection of GNSS spectrum from disruption and interference**

**U.S. policy on civil GPS access has been
stable and consistent for 30 years**



International Cooperation



- **U.S. goals for GNSS cooperation:**
 - Compatibility and interoperability
 - Transparency in civil service provision
 - Fair market access
 - Detecting, mitigating, and increasing resiliency to harmful interference
- **Bilateral relationships**
 - Russia, Europe, Japan, India, Australia, China
- **Multilateral engagement**
 - ICG, APEC, ICAO, IMO, ITU, NATO





U.S.-Russia Cooperation



- **GPS-GLONASS cooperation statement signed 2004**
 - Compatibility/interoperability of navigation signals
 - Interoperability of SAR-GPS and SAR-GLONASS
- **Collaborating toward placement of GLONASS monitoring stations at U.S. locations**
- **U.S. is closely monitoring Russian mandates for GLONASS equipage on certain vehicles**
 - Compliance standards are unclear to U.S. aircraft manufacturers
 - Technical regulations must comply with WTO obligations on Technical Barriers to Trade
 - U.S. recommends technology-neutral standards



Summary



- **GPS performance is better than ever and will continue to improve**
 - Testing new civil GPS signals this summer
 - More space and control segment upgrades coming
- **U.S. policy encourages worldwide GPS use**
 - International cooperation is a priority
 - GPS-GLONASS cooperation ongoing



For Additional Information...



The screenshot shows the GPS.gov website with the following elements:

- Browser address bar: www.gps.gov/internationals/
- Language selection menu: English, Español, Français, 中文, العربية (highlighted with a red circle)
- Header: GPS.GOV Official U.S. Government information about the Global Positioning System (GPS) and related topics
- Navigation menu: HOME, WHAT'S NEW, SYSTEMS, APPLICATIONS, GOVERNANCE, MULTIMEDIA, SUPPORT
- Left sidebar menu: For General Public, For News Media, For Congress, For Internationals (highlighted with a red circle), For Professionals, For Students
- Main content area: "U.S. and UK Reach Understanding on GPS Patents" with a "LEARN MORE..." link
- Section: "Multilingual Content" with sub-sections for Español and 中文, each listing relevant pages.
- Section: "GPS Cooperation with Other Nations" with a list of countries: Australia, China, Europe, India, Japan, Russia, United Kingdom, International Committee on GNSS, and Other International.

www.gps.gov

Спасибо



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